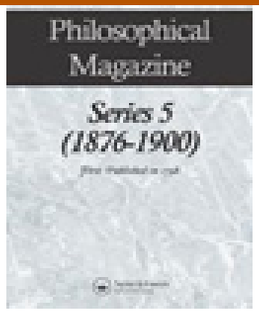

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On two new types of condensing hygrometers

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ments. The corrected volume of hydrogen was 85·3 cubic centim., which multiplied by 4 gives no less than 341·2 cubic centim. of hydrogen from 6·4790 grammes. This is about seven times the amount afforded by the original dust, and 3·8 times more than the mean of the results obtained with the dust which had been wetted.

Experiment II.—In this experiment, in which the full heat of a strong Bunsen flame was kept until the volume of hydrogen ceased perceptibly to increase, 90·7 cubic centim. of hydrogen were obtained from 1·6198 grammes, or 362·8 cubic centim. from 6·4790 grammes = 100 grains.

The above results confirm in the strongest manner the views I had entertained as to the source of the hydrogen in zinc dust, and conclusively show that exposure to a moist atmosphere at a moderate temperature is eminently favourable to the condensation of the hydrogen. It is not improbable that, by suitably modifying the conditions, this amount may be exceeded. As zinc dust thus charged with hydrogen can hardly fail to become an important chemical reagent, I shall endeavour to determine the maximum amount that can be occluded, and the ratio to the amount of metallic zinc present.—*Journal of Gas Lighting*, Oct. 13, 1885.

ON TWO NEW TYPES OF CONDENSING HYGROMETERS.

BY M. G. SIRE.

The accuracy of condensing hygrometers is known to depend on the exactitude with which we observe the temperature of the surface on which dew is deposited as well as on the more or less distinct perception of this deposit.

I have succeeded in rendering these determinations very distinct by observing the deposit of aqueous vapour on a cylindrical or a plane brilliant surface, which gives rise to two new types of condensing hygrometer, where the fall of temperature is produced by the evaporation of ether in which is a thermometer.

The reservoir of the first type consists of a cylindrical tube of thin polished metal, the ends of which are insulated in the *interior* by two pieces of ebonite, so that the volatile liquid is only in contact with the metal side by a middle zone of about 1 centim. in height. On this zone the dew is deposited; it shows itself by a whitish ring which appears at half the height of the reservoir.

The reservoir of the second is entirely of ebonite; it is traversed laterally by a circular aperture closed by a thin metal disk, polished on the inside. On the part of this disk which closes the aperture the dew is deposited, forming a dull white circle in the centre; under a certain angle the disk appears of a pure black.

The bright surfaces are obtained by an electrochemical deposit of palladium; the black polish of this metal reveals the slightest traces of condensation.

The essential character of these hygrometers is that the deposit is made in the centre of a brilliant metal surface without a break. On the other hand, the agitation of the liquid and the thinness of the sides ensures perfect equality of the two parts in each instrument.—*Comptes Rendus*, Sept. 28, 1885.